PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Nalinkumar L. Patel et al.	Attorney Dkt. No. 29610/CDT346
Application No. 10/531,070	Confirmation No.: 2522
Filed: October 10, 2003 (Int'l Application No. PCT/GB2003/004406)	Art Unit: 1715
For: Optical Device	Examiner: James Lin

APPEAL BRIEF

Mail Stop Appeal Brief—Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

This brief is timely filed pursuant to 37 CFR § 41.37 to support the notice of appeal the appellants filed on March 29, 2010 and is accompanied by payment of the fee set forth at 37 CFR § 41.20(b)(2). Pursuant to 37 CFR § 41.37(c), the following items are set forth herein under appropriate headings in the order and at the page indicated:

ITEM: **Page**

I. Real Party in Interest

The real party in interest in this appeal is Cambridge Display Technology Limited, the assignee of the entire right, title, and interest in the application. The assignment was recorded in the U.S. Patent and Trademark Office at Reel 017631, Frame 0039 on March 3, 2006, which constitutes the entire chain of title from the appellants to Cambridge Display Technology Limited.

II. Related Appeals and Interferences

There are no prior or pending appeals, interferences, or judicial proceedings known to the appellants, the appellants' legal representative, or the assignee that may be related to, directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

III. Status of Claims and Identification of Claims on Appeal

Claims rejected: 1-3 and 6-24.

Claims allowed: none.

Claims withdrawn: none.

Claims objected to: none.

Claims canceled: 4 and 5.

Claims on appeal: 1-3 and 6-24.

IV. Status of Amendments

An amendment dated March 29, 2010 to correct a typographical error was filed subsequent to the U.S. Patent and Trademark Office's final action dated October 27, 2009. The examiner indicated in the Advisory Action mailed on April 28, 2010 that the amendment will be entered. Accordingly, the appellants understand the current form of the claims on appeal are as presented March 29, 2010 and as reproduced in the Claims Appendix at Section VIII below.

V. Summary of Claimed Subject Matter

The present invention is directed to optical devices comprising a heat-treated organic layer and methods for the production thereof. A purpose of the invention is to improve the lifetime of organic semiconducting materials, in particular blue electroluminescent materials, thereby providing a solution to a known problem in the art. *See* the Application at p. 3, lines 7-13. Heating the device at a temperature *at or below the glass transition temperature* of the organic semiconducting material both *before and after* forming the second electrode as claimed improves the lifetime of the optical device relative to a single heat treatment alone (whether conducted before or after forming the second electrode). *See* the Application at p. 5, fourth paragraph and Figure 2 (comparing the comparative examples to the device of example 1).

Independent claim 1 recites a method of forming an optical device comprising the steps of: 1) providing a substrate carrying a first electrode capable of injecting or accepting charge carriers of a first type; 2) depositing a polyfluorene over the first electrode; 3) forming over the polyfluorene a second electrode capable of injecting or accepting charge carriers of a second type and 4) heating the polyfluorene before and after forming the second electrode, wherein both of the heat treatment steps are at or below the glass transition temperature of the polyfluorene.

Independent claim 19 recites a method of forming an optical device comprising the steps of: 1) providing a substrate carrying a first electrode capable of injecting or accepting charge carriers of a first type; 2) depositing an organic semiconducting material over the first electrode; 3) forming over said organic material a second electrode capable of injecting or accepting charge carriers of a first type and 4) heating the organic semiconducting material below its glass transition temperature before and after forming the second electrode.

VI. Grounds of Rejection to be Reviewed

The grounds of rejection presented for review are the rejection of claims 1-3 and 6-24 under 35 USC § 103(a) as being unpatentable over Aziz et al. (EP 1 178 546; "Aziz") in view of Lee et al. ("Improvement of EL efficiency in polymer light-emitting diodes by heat treatments"; "Lee 1") and/or Lee et al. ("The Effect of Different Heat Treatments on the Luminescence Efficiency of Polymer Light-Emitting Diodes"; "Lee 2"), optionally further in view of Towns et al. (WO 01/62869; "Towns"), Hirai (US Publication No. 2001/0028962; "Hirai") or Roach et al. (US Publication No. 2001/0055454; "Roach"). For purposes of this appeal, claims 1-3, 6-18 are grouped and argued together, and claims 19-24 are grouped and argued together.

VII. Argument

A. Introduction

Claims 1-3 and 6-24 stand rejected under 35 USC § 103(a) as being unpatentable over Aziz in view of Lee 1 and Lee 2, and optionally further in view of Towns, Hirai, and Roach. Independent claims 1 recites a method of forming an optical device comprising heating a polyfluorene layer at a temperature at or below its glass transition temperature before and after forming a second electrode over the polyfluorene. Independent claim 19 recites a method of formed an optical device comprising heating an organic semiconducting layer at a temperature below its glass transition temperature before and after forming a second electrode over said organic layer. The combination of Aziz with Lee 1 and Lee 2 does not teach or suggest heating the device at or below (much less simply "below" as recited in claims 19-24) the glass transition temperature of the organic layer both before and after formation of the second electrode and therefore does not support a rejection under § 103(a). Further modification of the proposed combination with any of Towns, Hirai or Roach does not cure the

aforementioned deficiencies. Therefore, the appellants respectfully submit that the outstanding claim rejections should be withdrawn.

B. Appeal of the 35 USC § 103(a) Rejections

1. Proper Basis for a § 103(a) Obviousness Rejection

A claim may be found obvious under 35 USC 103(a) "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 USC § 103(a). A determination that a claimed invention is obvious under § 103(a) is a legal conclusion involving the following factual inquiries: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the pertinent art. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the claimed subject matter pertains, who is presumed to have access to all prior art references in the field of the invention. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998). Furthermore, obviousness must be determined as of the time the invention was made and in view of the state of the art that existed at that time. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050-51 (Fed. Cir. 1988).

The Patent Office "has the burden under § 103 to establish a *prima facie* case of obviousness." *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988); MPEP § 2142 (8th Ed., Rev. 8, July 2010) ("The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness."). The Supreme Court recently identified a number of rationales that may be used to support a conclusion of obviousness, consistent with the framework set forth in its decision in *Graham v. John Deere. Co. See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007). To support a rejection under § 103, the Patent Office must clearly articulate facts and reasons why the claimed invention "as a whole" would have been obvious to a hypothetical person having ordinary skill in the art at least as of the claimed invention's effective filing date. *See KSR Int'l*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.")); *see also* MPEP § 2143 ("The key to supporting any rejection under 35 USC § 103 is the clear articulation of reason(s) why the claimed invention would have been obvious.").

2. No *Prima Facie* Case of Obviousness Has Been Set Forth

The Patent Office has not clearly articulated facts and reasons why the claimed invention as a whole would have been obvious to a hypothetical person having ordinary skill in the art as of the claimed invention's filing date. Specifically, the Patent Office has not articulated accurate findings of fact relating to the scope and content of the prior art and the differences between the claimed

invention and the prior art. *See* MPEP § 2143. The Patent Office, therefore, has not set forth a *prima facie* case of obviousness. Accordingly, the appellants respectfully request the Board reverse the final rejection of claims 1-3 and 6-24.

(a) The Rationale Purportedly Supporting a *Prima Facie* Case of Obviousness

Claims 1, 6-9, 12 and 14-24 stand rejected under § 103(a) as assertedly obvious over Aziz in view of Lee 1 and/or Lee 2. Aziz discloses an organic light emitting device (OLED) comprising a light emission region disposed between an anode and a cathode. The device in Aziz as fabricated is in an annealed condition. *See* Aziz , for example, at paragraphs 15 and 17. In the Office Action mailed on October 27, 2009 ("the Office Action"), the examiner explains that Aziz discloses heating the OLED device at a temperature below glass transition temperature after formation of the second electrode, and recognizes that Aziz does not teach heating the organic light-emitting material at a temperature below the glass transition temperature prior to forming the second electrode. *See* the Office Action at page 3. Lee 1 and Lee 2 teach baking a light-emitting film at a temperature below its glass transition temperature following spin-coating an emissive polymer to form the film and before deposition of the second electrode in order to remove residual solvent. *See* Lee 1 at page 250, column 2; Lee 2 at page 801, column 2. The Office Action asserts that it would have been obvious to combine the teachings of Aziz with Lee 1 and Lee 2 so as to heat the organic light emitting material of Aziz's device "immediately after spin-coating and prior to the formation of the second electrode with a reasonable expectation of success" in order to remove any residual solvent as taught by Lee 1 and Lee 2. *See* the Office Action at page 3.

Claims 2 and 3 stand rejected over Aziz in view of Lee 1 and Lee 2 and further in view of Towns. The Office Action acknowledges that Aziz does not teach the polyfluorene structure of claims 2 and 3. The Office Action asserts that Towns teaches the polymer structure of claims 2 and 3 and that it would have been obvious to substitute same for the organic light emitting material of Aziz. *See* the Office Action at page 4.

Claims 10 and 11 stand rejected over Aziz in view of Lee 1 and Lee 2 and further in view of Hirai. The Office Action concedes that Aziz does not teach the metal fluoride dielectric layer of the claimed invention. *See* the Office Action at page 4. The Office Action asserts that Hirai teaches the claimed metal fluoride layer and that it would have been obvious to incorporate the dielectric structure disclosed in Hirai between the light-emitting layer and the negative electrode of the device of Aziz .

Claim 13 stands rejected over Aziz in view of Lee 1 and Lee 2 and further in view of Roach. The Office Action admits that Aziz does not teach the hole transport material comprising PEDT/PSS of the claimed invention. *See* the Office Action at page 5. The Office Action asserts that Roach teaches the claimed hole transport material and that it would have been obvious to substitute the material disclosed in Roach for the material used in the device of Aziz.

(b) The Claimed Subject Matter

Independent claim 1 recites a method of forming an optical device comprising the steps of: 1) providing a substrate carrying a first electrode capable of injecting or accepting charge carriers of a first type; 2) depositing a polyfluorene over the first electrode; 3) forming over the polyfluorene a second electrode capable of injecting or accepting charge carriers of a second type; and 4) further comprising heating the polyfluorene before and after forming the second electrode, wherein both of the heat treatment steps are at or below the glass transition temperature of the polyfluorene. Patentability of dependent claims 2-3, and 6-18 is not independently argued. Claims 1-3 and 6-18 are therefore argued together.

Independent claim 19 recites a method of forming an optical device comprising the steps of: 1) providing a substrate carrying a first electrode capable of injecting or accepting charge carriers of a first type; 2) depositing an organic semiconductor over the first electrode; 3) forming over the organic semiconducting material a second electrode capable of injecting or accepting charge carriers of a second type; and 4) further comprising heating the organic semiconductor below its Tg before and after forming the second electrode. Patentability of dependent claims 20-24 is not independently argued. Claims 19-24 are therefore argued together.

(c) The Claimed Subject Matter Is Not *Prima Facie* Obvious Over the Disclosures in the Applied Prior Art

Aziz discloses heating the "as-fabricated device" at an "annealing temperature ... below the glass transition temperature of a material having the lowest glass transition temperature of the entire organic light emitting device", i.e., Aziz discloses heating the device below glass transition temperature *after* formation of the second electrode. *See* Aziz at paragraph 17. Aziz does *not teach or suggest* heating the organic light-emitting material at any temperature *before* forming the second electrode, however, much less at a temperature at or below the glass transition temperature, as claimed. In view of this deficiency, the examiner turned to the teachings of Lee 1 and Lee 2.[1]

Lee 1 and Lee 2 both teach baking a light-emitting polymer film at a temperature below the polymer glass transition temperature before depositing the second electrode in order to remove residual solvent. *See* Lee 1 at page 250, column 2; Lee 2 at page 801, column 2. The examiner asserts that it would have been obvious to combine the teachings of Aziz with Lee 1 and Lee 2 so as to heat the organic light emitting material of Aziz's device "prior to the formation of the second electrode with a reasonable expectation of success" in order to remove any residual solvent as taught by Lee 1 and Lee 2. *See* the Office Action at page 3. The appellants respectfully submit, however, that the teachings of Lee 1 and Lee 2, when properly considered as wholes, would in fact motivate the

[1] Lee 1 and Lee 2 have significant overlap in disclosure (and authorship) and are sometimes discussed in conjunction as a result.

skilled person to heat an emissive polymer _above_ its glass transition temperature (before and/or after deposition of the second electrode/metal cathode), and in fact teach away from heating the emissive polymer _at or below_ its glass transition temperature before forming the second electrode as claimed.

Lee 1 and Lee 2 both disclose annealing the film at a temperature above its glass transition temperature after baking the film at a temperature below its glass transition temperature. Specifically, after the baking step, Lee 1 and Lee 2 both disclose annealing *above* the glass transition temperature *before and/or after* forming the second electrode. Lee 1 and Lee 2 both further teach that conducting only post-deposition annealing in conjunction with the baking step provides the most efficient EL device. *See* Lee 1 at page 251, column 2; Lee 2 at page 803, column 2. Moreover, both Lee 1 and Lee 2 suggest a relationship between the initial baking step and the subsequent annealing step disclosed therein. In this respect, a consequence of the baking step is the introduction of "pores [into the polymer film, the pores] left after evaporating the solvent by baking below Tg." *See* Lee 1 at page 249, column 2; *see also* Lee 2 at page 801, column 2. Subsequent annealing above the glass transition temperature enhances the packing of the film because of the introduced pores (free volume). Specifically, Lee1 and Lee 2 teach that when the film is annealed at a temperature above Tg, the polymer chains of the polymer film are able to move more freely resulting in (1) enhanced packing and/or (2) enhanced adhesion between the emissive polymer and the metal cathode. *See* Lee 1 at page 249, paragraph bridging columns 1 and 2, and at page 250, paragraph bridging columns 1 and 2; Lee 2 at page 801, column 2, and at page 802, column 2. Additionally, Lee 1 explicitly states that "[t]hermal annealing above Tg is *needed* to reduce the imperfection (or impurity factor) of the film and the interface in EL devices, and thus to improve the luminous efficiency." *See* Lee 1 at page 251, column 1 (emphasis added). Thus, when appropriate consideration is given to the entirety of the respective disclosures, it is evident that both Lee 1 and Lee 2 teach that the baking step below glass transition temperature and the annealing step above glass transition temperature should be performed *in combination*.

As the annealing steps disclosed in Lee 1 and Lee 2 are above glass transition temperature and thus not in accordance with the claimed invention, the examiner has taken the position that the baking step below glass transition temperature in Lee 1 and Lee 2 is separable from the annealing steps performed above glass transition temperature, i.e., "only the baking step of the Lee references were used in the rejections." *See* the Office Action at page 5. The appellants respectfully maintain that Lee 1 and Lee 2, when properly considered in their entireties, would not motivate the skilled person to incorporate a baking step below the glass transition temperature performed in isolation, i.e., without an additional annealing step above the glass transition temperature. In this respect, a device formed using only a baking step below the glass transition temperature is considered "unannealed" in Lee 1 and Lee 2. *See* Lee 1 at page 250, column 2; Lee 2 at page 801, column 2. As mentioned above, Lee 1 teaches that "[t]hermal annealing above Tg is *needed* to reduce the imperfection (or impurity factor) of the film and the interface in EL devices, and thus to improve the luminous

efficiency." Lee 1 at page 251, column 1 (emphasis added). Similarly, Lee 2 teaches that "in the unannealed [device] the defects, such as pores in the film, may accelerate electrical failure." Lee 2 at page 801, column 2. As these defects are introduced by the baking step, one of ordinary skill would not be motivated to decouple the subsequent annealing step performed above glass transition temperature which reduce these defects therefrom. Consistent with the foregoing statement, Lee 1 and Lee 2 teach that annealing at a temperature above the glass transition temperature produces multiple benefits over an unannealed device, including increased stability, increased current, decreased operating voltage, increased maximal intensity, and increased efficiency. *See* Lee 1 at Figures 1-3; Lee 2 at Figures 2-3.

In view of the foregoing, the appellants respectfully submit that Lee 1 and Lee 2 cannot be relied upon to teach a baking step below the glass transition temperature without subsequent annealing at a temperature above the glass transition temperature.

Nonetheless, the examiner asserted that the combination of Aziz with Lee 1 and Lee 2 would have explicitly taught away from annealing at temperatures above the glass transition temperature. *See* the Office Action at page 5. The appellants respectfully disagree.

Aziz teaches that annealing should be conducted at a temperature below the *melting temperature* of the light emissive material. *See* Aziz at paragraph 85. An annealing temperature below the glass transition temperature of the light-emissive region is suggested as a preferred embodiment in Aziz, but temperatures above the glass transition temperature (and below the melting temperature) are possible. *See* Aziz at paragraph 0085. Therefore, the examiner's assertion that the proposed combination teaches away from annealing at temperatures above the glass transition temperature does not have an appropriate foundation since annealing at temperatures above the glass transition temperature is not in conflict with the disclosure of Aziz as the examiner suggested.

Additionally, Aziz teaches an OLED device formed using annealing to 1) decrease the operating voltage of the device and 2) increase the energy conversion efficiency of the device. *See* Aziz at paragraphs 15, 17, and claim 2. Aziz further teaches that the energy conversion efficiency is a function of the operating voltage and quantum efficiency, with a decrease in operating voltage without a decrease in quantum efficiency resulting in an increase in the energy conversion efficiency. *See* Aziz at paragraphs 0005 and 0009. On the other hand, Lee 1 and Lee 2 teach that annealing the device at a temperature above the glass transition temperature reduces the operating voltage by up to 40% and increases the quantum efficiency of the device. *See* Lee 1 at Abstract; Lee 2 at page 802, column 2. Therefore, annealing at a temperature *above* glass transition temperature as taught in Lee 1 and Lee 2 satisfies the requirements set forth in Aziz of reducing the operating voltage and improving the energy conversion efficiency. As a result, when the cited documents are considered in their entireties, one of ordinary skill would not be motivated to modify Aziz to include a baking step below the glass transition temperature without also performing subsequent annealing at a

temperature above the glass transition temperature (particularly since such a step is not in conflict with the disclosure of Aziz as the examiner suggested).

Indeed, as stated above, Lee 1 and Lee 2 teach that annealing at a temperature above the glass transition temperature can greatly improve the performance of the device. *See* Lee 1 at Abstract; Lee 2 at page 803, column 2. The examiner did not clearly articulate in the Office Action why one skilled in the art would deviate from such teachings. *See W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (finding improper the failure to explain "what there was in the prior art that would have caused those skilled in the art to disregard the teachings there found"). In view of the foregoing, the appellants again respectfully submit that the combination of Aziz with Lee 1 and Lee 2, if made, would motivate one skilled in the art to anneal the device at a temperature above the glass transition temperature and thus not according to the claimed invention. Therefore, a rejection under § 103(a) is not supported.

Finally, as mentioned above, the examiner asserted that Aziz explicitly teaches away from annealing at temperatures above the glass transition temperature. *See* the Office Action at page 5. Even if Aziz is read as suggested by the examiner, i.e., as teaching that the annealing temperature *must* be below the glass transition temperature, Aziz may not properly be combined with Lee 1 and Lee 2 because these references teach away from the proposed combination. As discussed above, Lee 1 and Lee 2 both teach one skilled in the art to use an annealing temperature above the glass transition temperature of the emissive polymer layer in order to enhance device performance. Lee 2 further teaches annealing above the glass transition temperature "to change the morphological properties of the EL polymer and interfacial properties of the EL device." *See* Lee 2 at page 801, column 2; *see also* Lee 1 at page 250, column 1. Lee 2 further indicates that altering the polymer morphology is desirable by teaching that "heat treatments below the Tg *cannot* change the electrical properties because they *do not alter the morphology* of the emissive polymer." *See* Lee 2 at page 801, column 2 (emphasis added). On the other hand, the examiner recognized that Aziz explicitly teaches away from annealing temperatures that substantially change the structure of the optical device layers. *See* the Office Action at page 5. As a result, the appellants respectfully submit that the skilled person would not be motivated to combine Aziz with disclosures such as Lee 1 and Lee 2 which teach that altered morphology can be advantageous, much less to modify Aziz to include a baking step that was found to introduce voids into the polymer film and thereby increase the ability to change its morphology. The outstanding claim rejections should be removed for this additional reason.

VIII. Conclusion

For the reasons discussed above, independent claims 1 and 19 are not obvious under 35 USC §103(a) over Aziz in view of Lee 1 and/or Lee 2. The combination of Aziz with Lee 1 and/or Lee 2 therefore cannot support rejections of dependent claims 6-9, 12, 14-18, and 20-24. Towns, Hirai,

and Roach do not cure the aforementioned deficiencies and thus do not support the rejections of dependent claims 2-3, 10-11, and 13.

The appellants respectfully request that the Board reverse the final rejection of claims 1-3 and 6-24, and remand the application to the examiner with instructions to allow the application.

Respectfully submitted,

MARSHALL, GERSTEIN & BORUN LLP

October 29, 2010

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IX. Claims Appendix

The following is a list of the application claims involved in the appeal.

1. (Previously presented) A method of forming an optical device comprising the steps of:

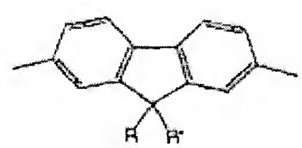
- providing a substrate carrying a first electrode capable of injecting or accepting charge carriers of a first type;

- depositing a polyfluorene over the first electrode; and

- forming over the polyfluorene a second electrode capable of injecting or accepting charge carriers of a second type,

and further comprising heating the polyfluorene before and after forming the second electrode, wherein both of the heat treatment steps are at or below the glass transition temperature of the polyfluorene.

2. (Previously presented) A method according to claim 1 wherein the polyfluorene comprises optionally substituted units of formula (I);



(I)

wherein R end R' are independently selected from hydrogen or optionally substituted alkyl, alkoxy, aryl, arylalkyl, heteroaryl and heteroarylalkyl, and R and R' may be combined to form an optionally substituted monocyclic or polycyclic group.

3. (Previously presented) A method according to claim 2 wherein at least one of R and R' comprises an optionally substituted phenyl or C_4 - C_{20} alkyl group.

4. (Canceled)

5. (Canceled)

6. (Previously presented) A method according to claim 1 wherein the optical device is an electroluminescent device.

7. (Original) A method according to claim 6 wherein the first electrode is an anode and the second electrode is a cathode.

8. (Original) A method according to claim 7 wherein the cathode comprises a metal having a workfunction of less than 3.5 eV.

9. (Original) A method according to claim 8 wherein the cathode comprises a layer of calcium.

10. (Previously presented) A method according to claim 7 further comprising locating a layer of dielectric material between the polyfluorene and the cathode.

11. (Original) A method according to claim 10 wherein the layer of dielectric material comprises a metal fluoride.

12. (Previously presented) A method according to claim 1 comprising providing a layer of conductive organic material between the first electrode and the polyfluorene.

13. (Previously presented) A method according to claim 12 wherein the layer of conductive organic material is PEDT / PSS.

14. (Previously presented) A method according to claim 1 wherein the polyfluorene comprises a plurality of regions including at least two of a hole transporting region, an electron transporting region and an emissive region.

15. (Previously presented) A method according to claim 14 wherein polyfluorene comprises a hole transporting region, an electron transporting region and an emissive region.

16. (Previously presented) A method according to claim 1 wherein the polyfluorene is a blue electroluminescent material.

17. (Previously presented) An optical device obtained by the method according to claim 1.

18. (Original) An optical device according to claim 17 that is an electroluminescent device.

19. (Previously presented) A method of forming an optical device comprising the steps of:

providing a substrate carrying a first electrode capable of injecting or accepting charge carriers of a first type;

depositing an organic semiconductor over the first electrode; and

forming over the organic semiconducting materiel a second electrode capable of injecting or accepting charge carriers of a second type, and further comprising heating the organic semiconductor below its glass transition temperature before and after forming the second electrode.

20. (Original) A method according to claim 19 wherein the organic semiconductor is a polymer.

21. (Original) A method according to claim 20 wherein the organic semiconductor is a polyfluorene.

22. (Previously presented) A method according to claim 19 wherein the optical device is an electroluminescent device.

23. (Previously presented) An optical device obtained by the method according to claim 20.

24. (Original) An optical device according to claim 23 that is an electroluminescent device.

Evidence Appendix

There was no evidence submitted pursuant to 37 CFR §§ 1.130, 1.131, or 1.132 or other evidence entered by the examiner during prosecution and relied upon by the appellants in the appeal.

Related Proceedings Appendix

There are no related proceedings. *See* Section II above.